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## LAMPIRAN

```
#include <LiquidCrystal_I2C.h>

#include <RTCLib.h>

#include <Servo.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

Servo mekanik;

byte pinLDR = A2;

byte pinPompa = 5;

int pompaON = LOW;

int pompaOFF = HIGH;

int nilai;

#define Buzzer 2

#define trigPin 7

#define echoPin 8

long durasi;

int level;

RTC_DS3231 rtc;

char dataHari[7][12] = {"minggu", "senin", "selasa", "rabu", "kamis",
"jumat", "sabtu"};
```

```
String hari;

int tanggal, bulan, tahun, waktu, jam, menit, detik;

const int relay= 6;

void setup() {

  Serial.begin(9600);

  lcd.begin();

  lcd.backlight();

  lcd.print("Smart System");

  lcd.setCursor(0, 1);

  lcd.print("Aquarium");

  delay(3000);

  lcd.clear();

  pinMode(pinLDR, INPUT);

  pinMode(pinPompa, OUTPUT);

  digitalWrite(pinPompa, pompaOFF);

  pinMode(trigPin, OUTPUT);

  pinMode(echoPin, INPUT);

  pinMode(Buzzer, OUTPUT);

  rtc.begin();
```

```
//rtc.adjust(DateTime(F(__DATE__), F(__TIME__)));  
  
//rtc.adjust(DateTime(2021, 6, 27, 1, 45, 0));  
  
//rtc.setDateTime(dt);  
  
mekanik.attach(3);  
  
mekanik.write(0);  
  
pinMode(relay,OUTPUT);  
}  
  
void loop() {  
  nilai = analogRead(pinLDR);  
  Serial.print("Nilai LDR: ");  
  Serial.println(nilai);  
  if (nilai <180) {  
    Serial.println("Jernih");  
    digitalWrite(pinPompa, pompaOFF);}  
  if (nilai >100) {  
    Serial.println("Keruh");  
    digitalWrite(pinPompa, pompaON);}  
  delay(100);  
  lcd.setCursor(0, 0);  
  lcd.print("Kekeruhan Air:");  
  lcd.print(nilai < 180);
```

```
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(5);
durasi = pulseIn(echoPin, HIGH);
level = durasi*0.034/2;
if (level >= 10){
digitalWrite(Buzzer,HIGH);}
if (level <= 11){
digitalWrite(Buzzer,LOW);
delay(500);
Serial.print("level: ");
Serial.print(level);
Serial.println(" cm");
}

DateTime now = rtc.now();
hari   = dataHari[now.dayOfTheWeek()];
tanggal = now.day(), DEC;
bulan  = now.month(), DEC;
tahun  = now.year(), DEC;
jam    = now.hour(), DEC;
menit  = now.minute(), DEC;
```

```
detik = now.second(), DEC;

Serial.println(String() + jam + ":" + menit + ":" + detik);

lcd.setCursor(0, 1);

lcd.print("Level:");

lcd.print(level);

lcd.print("cm");

lcd.print(" ");

lcd.print(jam); lcd.print(":"); lcd.print(menit); lcd.print(" ");

delay(500);

if(jam == 6 & menit == 0 & detik == 0){
  kasihpakan(5);
}

if(jam == 11 & menit == 0 & detik == 0){
  kasihpakan(5);
}

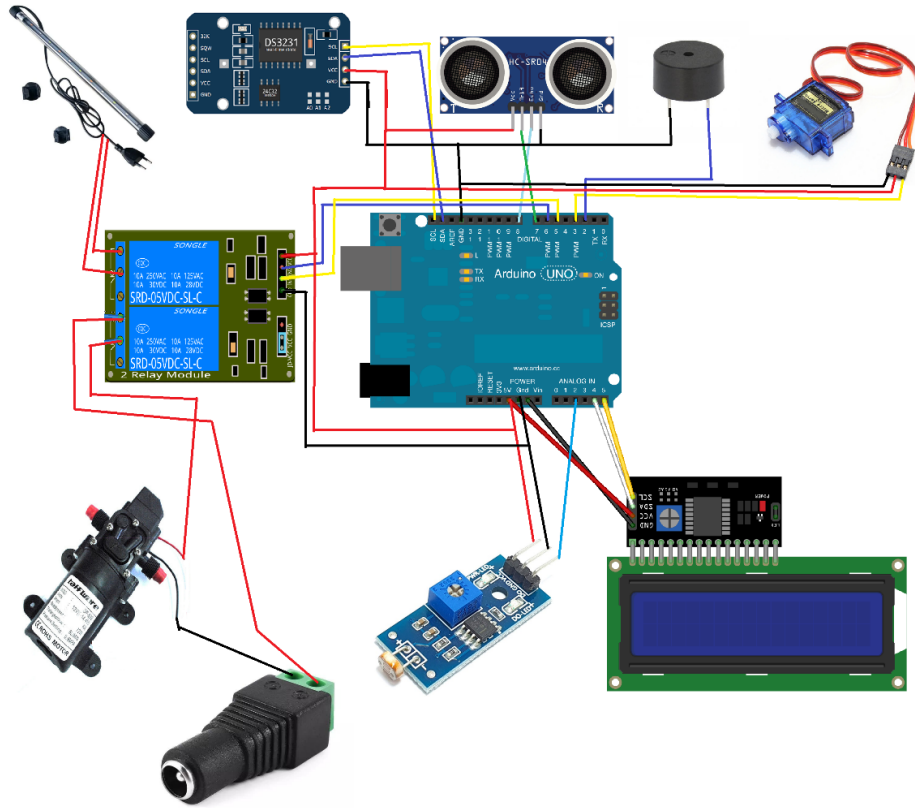
if(jam == 8 & menit == 0 & detik == 0){
  kasihpakan(5);
}

if ((now.hour() >= 17) || (now.hour() < 1)) {
  digitalWrite(relay, LOW);
} else {
```

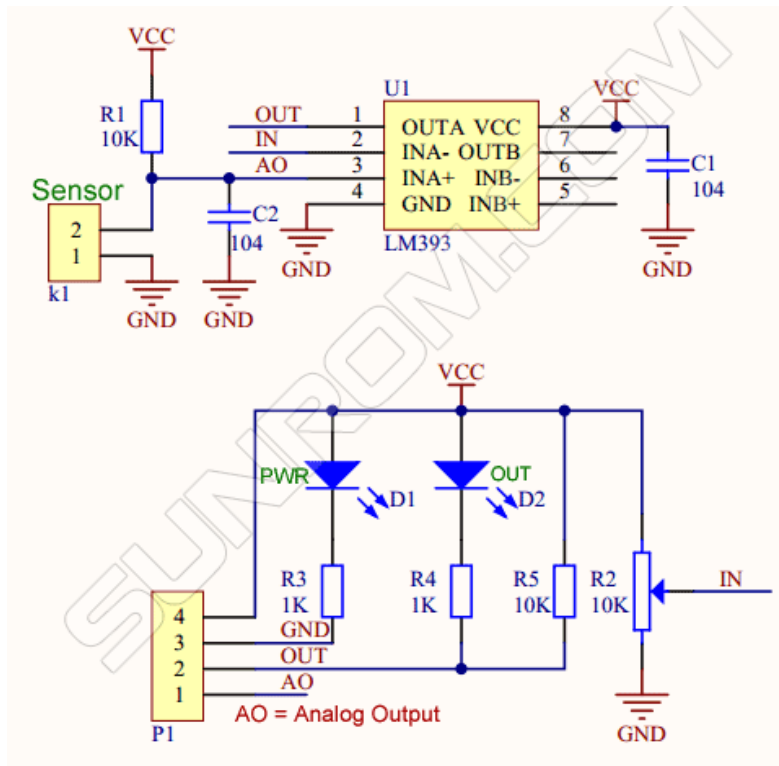
```
digitalWrite(relay, HIGH);  
}  
}  
void kasihpakan(int jumlah){  
  for(int i=1; i <= jumlah; i++){  
    mekanik.write(150);  
    delay(100);  
    mekanik.write(0);  
    delay(100);  
  }  
}
```



Gambar Rangkain Keseluruhan



## DATASHEET MODULE SENSOR LIGHT DEPENDENT RESISTOR (LDR)



### Pin details

- VCC = 3.3V to 5V DC
- GND = Ground
- DO = Digital Output
- AO = Analog Output

Photosensitive resistor module most sensitive to environmental light intensity is generally used to detect the ambient brightness and light intensity. Module light conditions or light intensity reach the set threshold, DO port output high, when the external ambient light intensity exceeds a set threshold, the module DO output low; Digital output DO directly connected to the MCU, and detect high or low TTL, thereby detecting ambient light intensity changes; Digital output module DO can directly drive the relay module, which can be composed of a photoelectric switch; Analog output module AO and AD modules can be connected through the AD converter, you can get a more accurate light intensity value

### Specifications

- Operating Voltage: 3.3V to 5V DC
- Operating Current: 15ma
- Output Digital - 0V to 5V, Adjustable trigger level from preset
- Output Analog - 0V to 5V based on light falling on the LDR
- LEDs indicating output and power
- PCB Size: 3.2cm x 1.4cm
- LM393 based design

## HC-SR04 User Guide

### 1. Ultrasonic Distance Measurement Principles

The transmitter emits a 8 bursts of an directional 40KHz ultrasonic wave when triggered and starts a timer. Ultrasonic pulses travel outward until they encounter an object, The object causes the the wave to be reflected back towards the unit. The ultrasonic receiver would detect the reflected wave and stop the stop timer. The velocity of the ultrasonic burst is 340m/sec. in air. Based on the number of counts by the timer, the distance can be calculated between the object and transmitter The TRD Measurement formula is expressed as:  $D = C \times T$  which is know as the time/rate/distance measurement formula where D is the measured distance, and R is the propagation velocity (Rate) in air (speed of sound) and T represents time. In this application T is divided by 2 as T is double the time value from transmitter to object back to receiver.

### 2. Product Features

#### Features

- Stable performance (Xtal.)
- Accurate distance measurement
- High-density SMD Board
- Close Range (2cm)

#### Uses

- Robotics barrier
  - Object distance measurement
  - Level detection
  - Security systems
  - Vehicle detection/avoidance
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